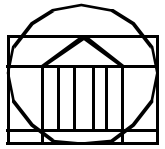

Performance Modeling for the HLA

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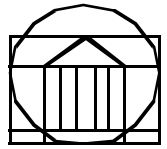
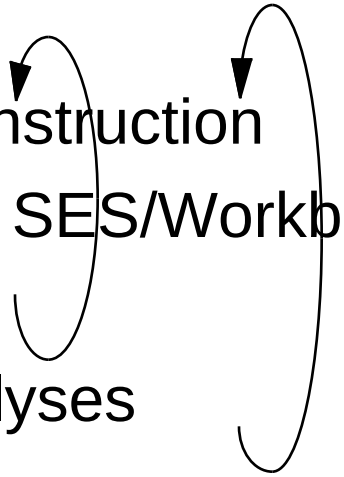
Project Overview



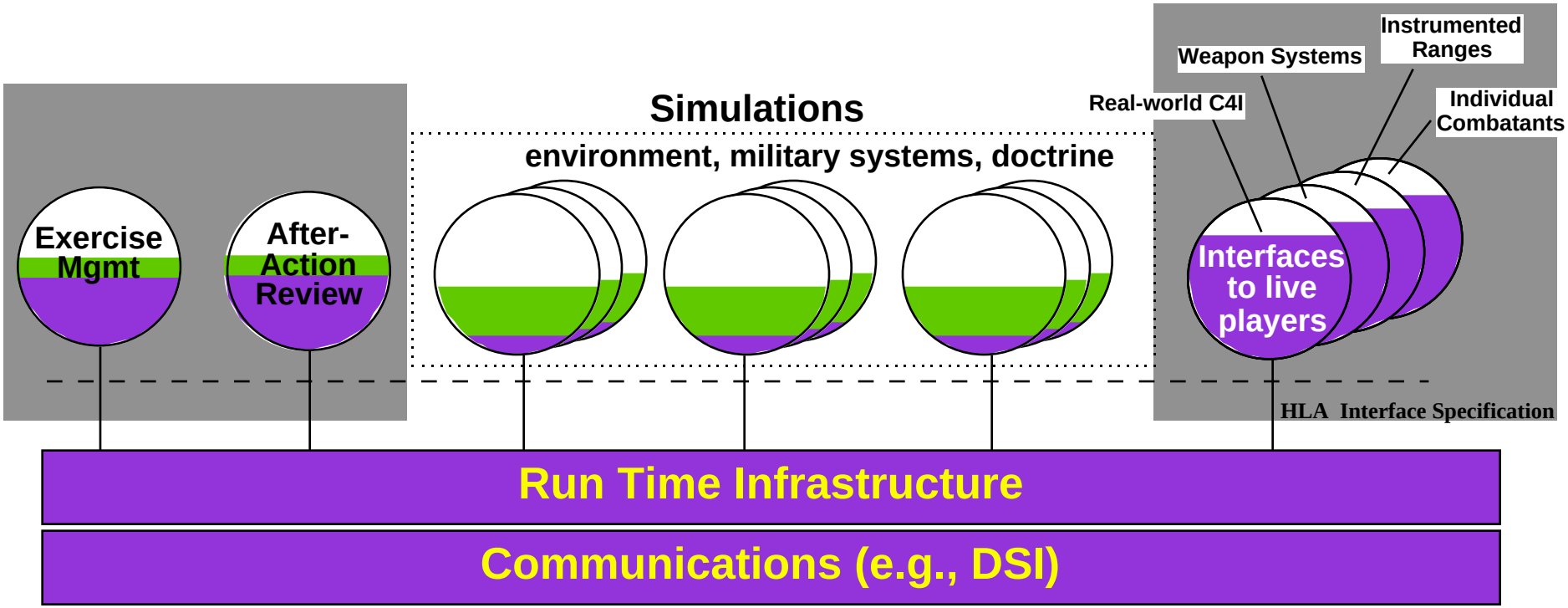
- What?
  - Configurable simulation model of HLA-compliant federations
  - **Performance** model: stochastic, resource usage and contention
- Why?
  - Performance characteristics of current and future federations - federation analysis tool
  - Broader testing and more economical than prototyping
  - Non-intrusive analysis

Modeling Approach

- Data gathering
- Conceptual model construction
- Implementation using SES/Workbench
- Validation
- Experiments and analyses



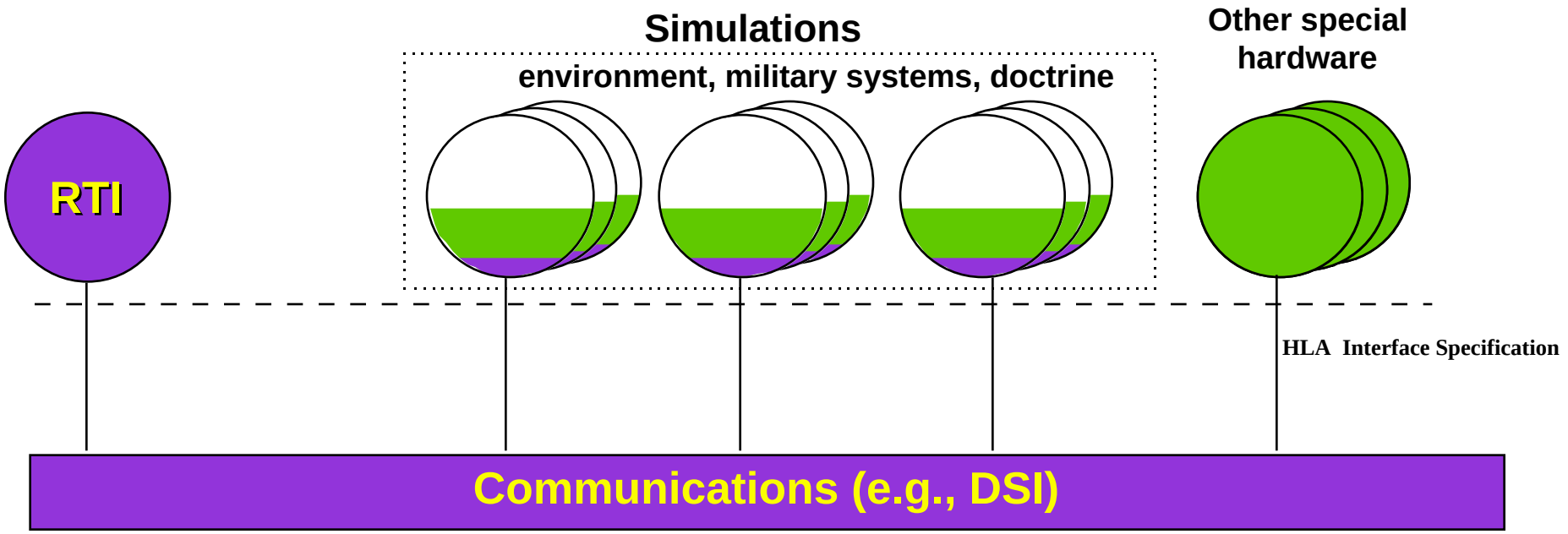
Performance Perspective



Key:

- developed once, reusable across all DoD simulation systems
- developed once, reusable across a simulation domain
- unique

Physical Organization



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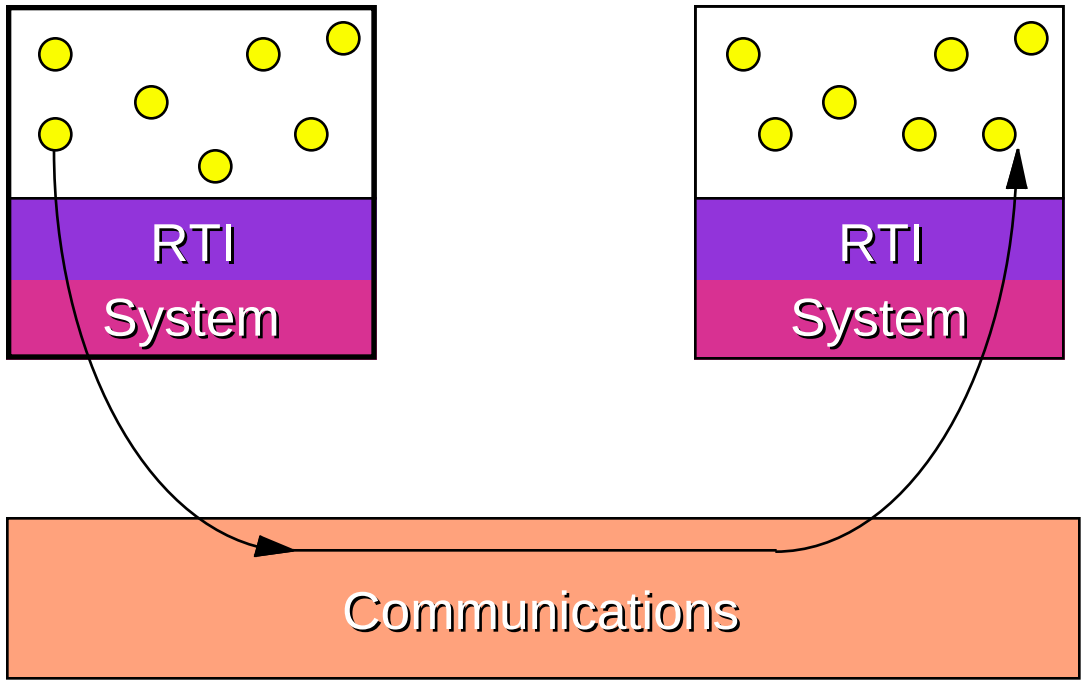
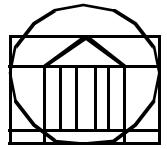
Federate Submodel



Objects

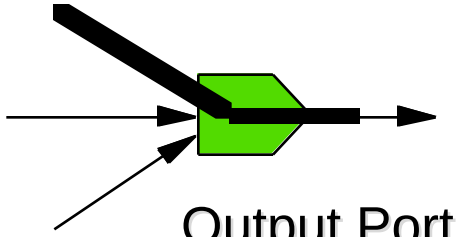


- Carry their own parameters
  - Id
  - Class
  - Group
  - Execution time
  - Activity state
  - Transition matrix
  - Probability of selection
  - Probability distribution for generating RTI calls
  - <others>

	H	M	Q	**P**
H	0.5	0.4	0.1	0.7
M	0.1	0.2	0.7	0.2
Q	0.1	0	0.9	0.1

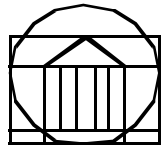
Communications Submodel

- Currently focused on JPSD comms: ATM Switch



- Transport delay = latency + message size/bandwidth

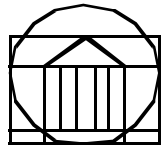
Performance Framework



- List of MoP's
  - Latency
  - Resource Utilization
- Configuration Variables
- Control Variables

- Being used by JPSD to design experiments

Project Status



- Basic conceptual model complete
- Model infrastructure implemented and running
  - objects
  - machines
  - communications
- Enhancements being added
  - publish/subscribe
  - event driven federates
  - interactions
  - event sequences for RTI calls
  - more communications